



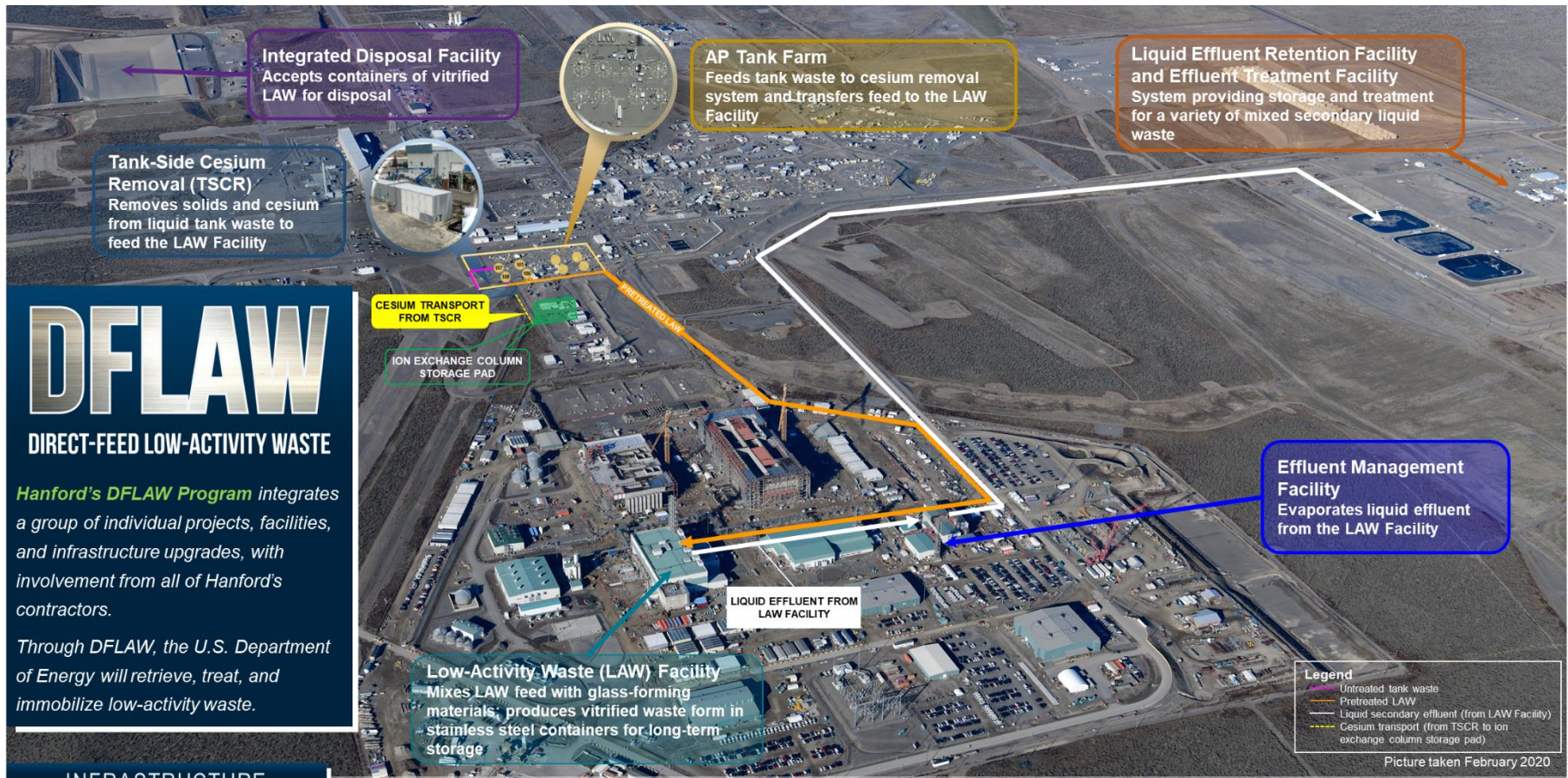
THE HANFORD SITE

Proposed Permit Modification in Support of the Effluent Treatment Facility Supplemental Organics Treatment System

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U.S. Department of Energy, Office of River Protection
Tank Farms Programs Division

July 22, 2021

Direct-Feed Low-Activity Waste Configuration



DFLAW DIRECT-FEED LOW-ACTIVITY WASTE

Hanford's DFLAW Program integrates a group of individual projects, facilities, and infrastructure upgrades, with involvement from all of Hanford's contractors.

Through DFLAW, the U.S. Department of Energy will retrieve, treat, and immobilize low-activity waste.

INFRASTRUCTURE

ELECTRICAL

WATER/SEWER

ROADS

SECURITY

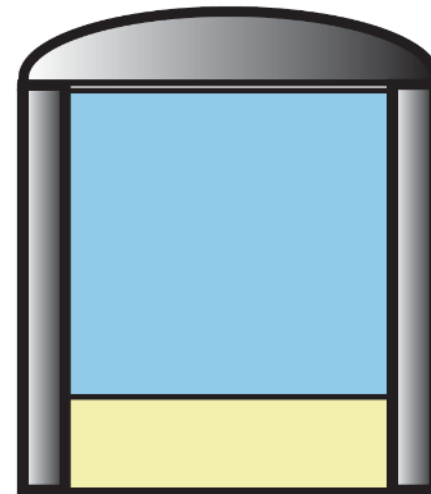
INFORMATION TECHNOLOGY

EMERGENCY PREPAREDNESS

Direct-Feed Low-Activity Waste Configuration (cont.)

Chemical and radioactive waste is stored in Hanford's Tank Farms. The U.S. Department of Energy (DOE) will safely, efficiently and effectively treat Hanford tank waste through the Direct-Feed Low-Activity Waste (DFLAW) process to vitrify it (immobilize it within glass).

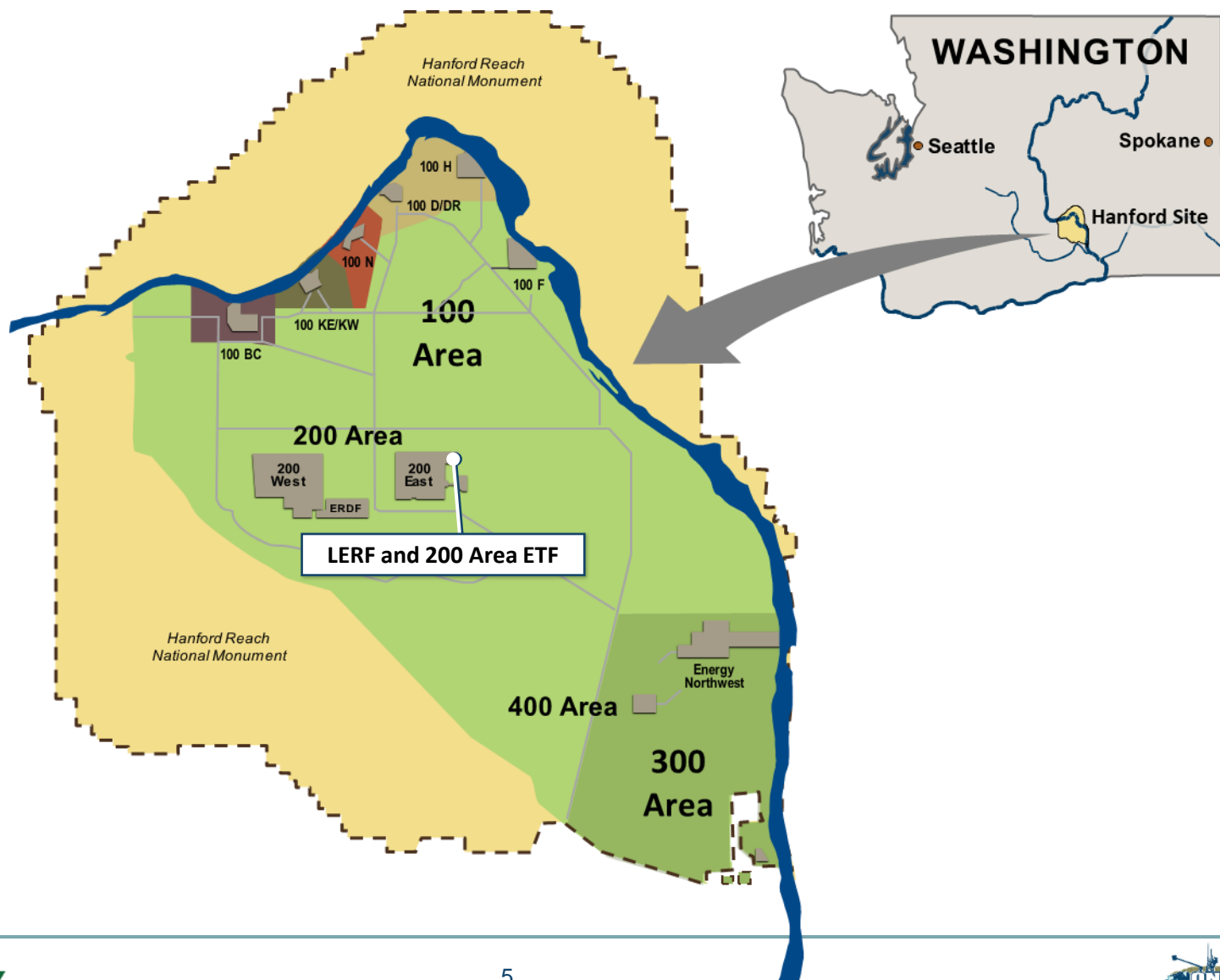
- Secondary liquid waste will be created during the vitrification of low-activity waste in the Waste Treatment and Immobilization Plant (WTP) during the DFLAW process
- The Liquid Effluent Retention Facility (LERF) and the 200 Area Effluent Treatment Facility (ETF) will be used to manage and treat the secondary liquid waste

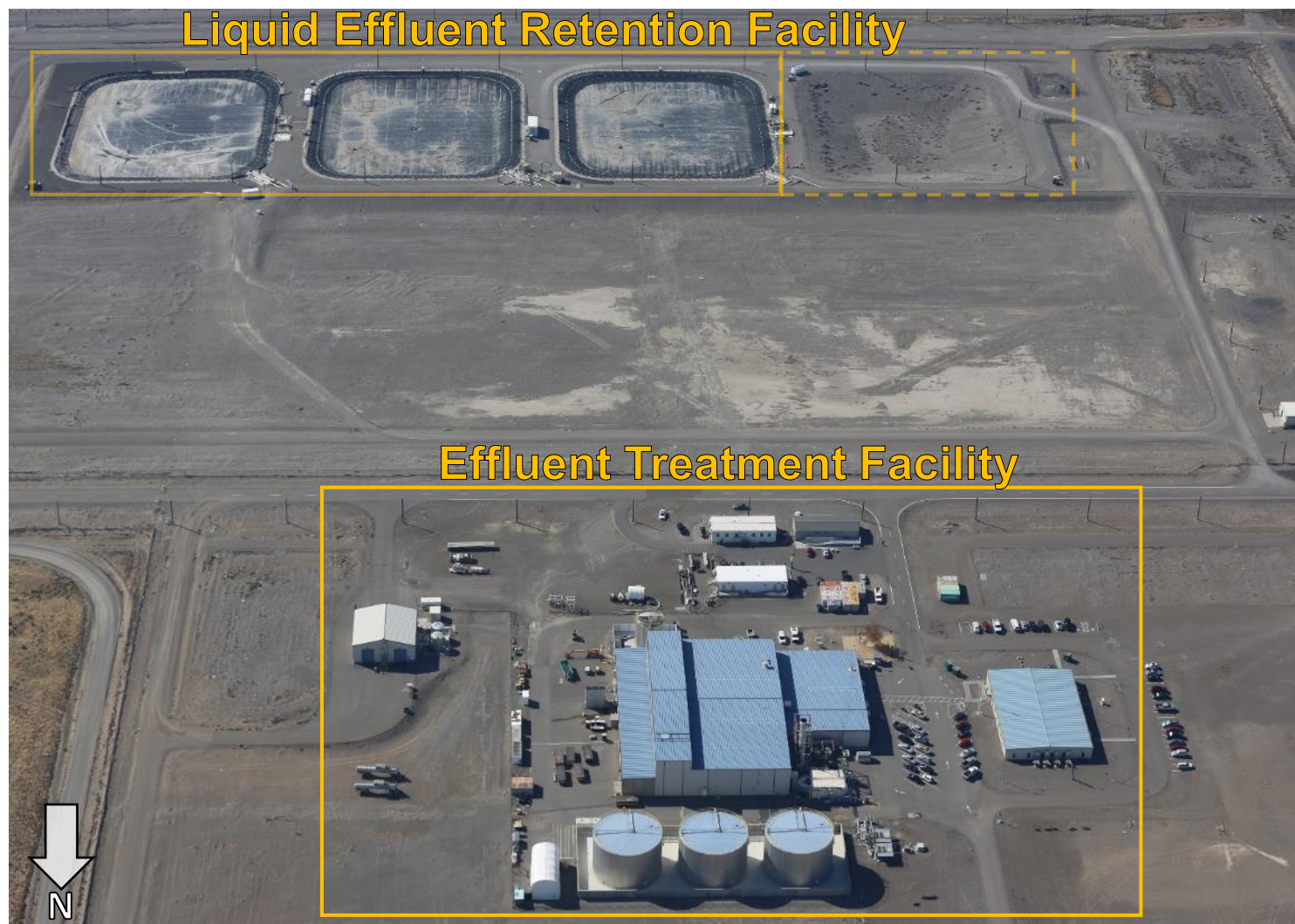


Regulatory Framework for Permitting Action

- The *Resource Conservation and Recovery Act* Hanford Dangerous Waste Permit governs dangerous waste treatment, storage and disposal at the Hanford Site
- The Washington State Department of Ecology (the regulator) issued the current Hanford Sitewide permit (Revision 8C), which governs hazardous tank waste treatment, storage and disposal
- The permittees (DOE and contractor Washington River Protection Solutions) are proposing a Class 2 permit modification to the LERF and 200 Area ETF permit sections, Operating Unit Group 3

Hanford Site Map





The 200 Area ETF treats liquid waste from Hanford Site sources. In the near future, operations will expand to include management of the WTP DFLAW effluent.



View of the primary treatment train in the ETF process area

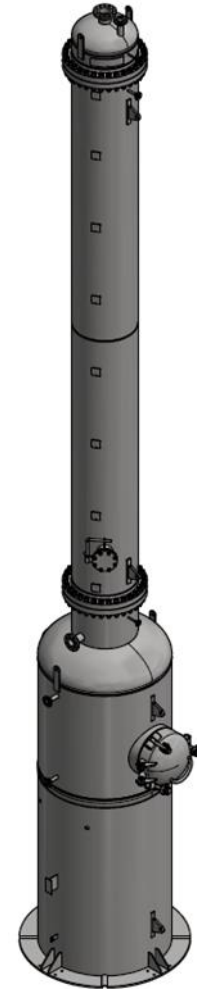
The composition of the WTP DFLAW effluent was reviewed and found to have a high concentration of organic constituents that will require additional organic treatment above the current capabilities of the existing 200 Area ETF

- Organic treatment is currently performed at the 200 Area ETF using an Ultraviolet Light/Oxidation (UV/OX) system
- The UV/OX technology was found to not be as effective treating some projected organic constituents to their regulatory treatment levels
- Installation of a steam stripper system within the primary treatment train of the 200 Area ETF will provide the necessary supplemental organic treatment

Steam stripping is a distillation process in which volatile organics are stripped from a liquid using steam

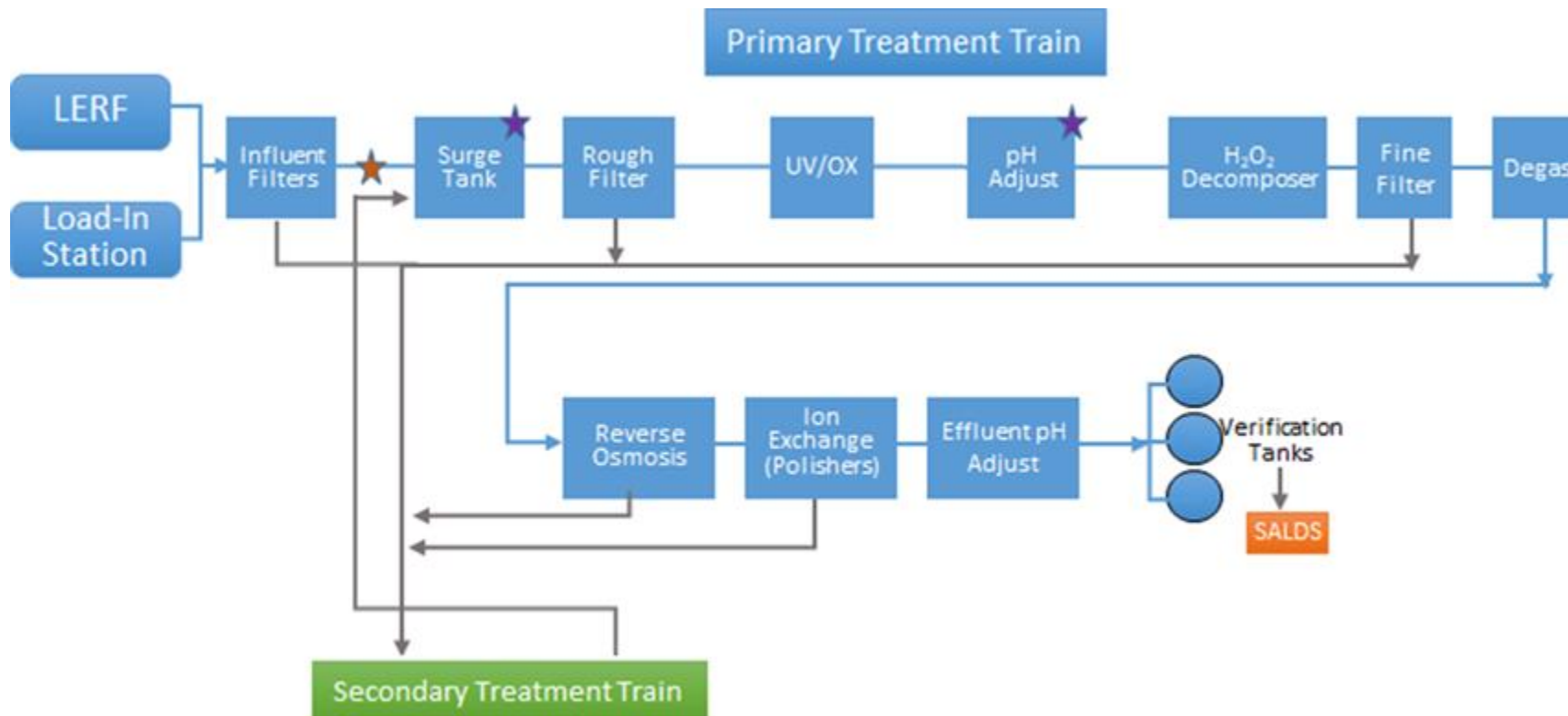
The technology was chosen for the following reasons:

- Flexibility and adaptability
- Safety implications
- Implementation
- Technology maturity
- Cost and schedule



Steam stripper distillation column

Primary Treatment Train: Before Proposed Modification

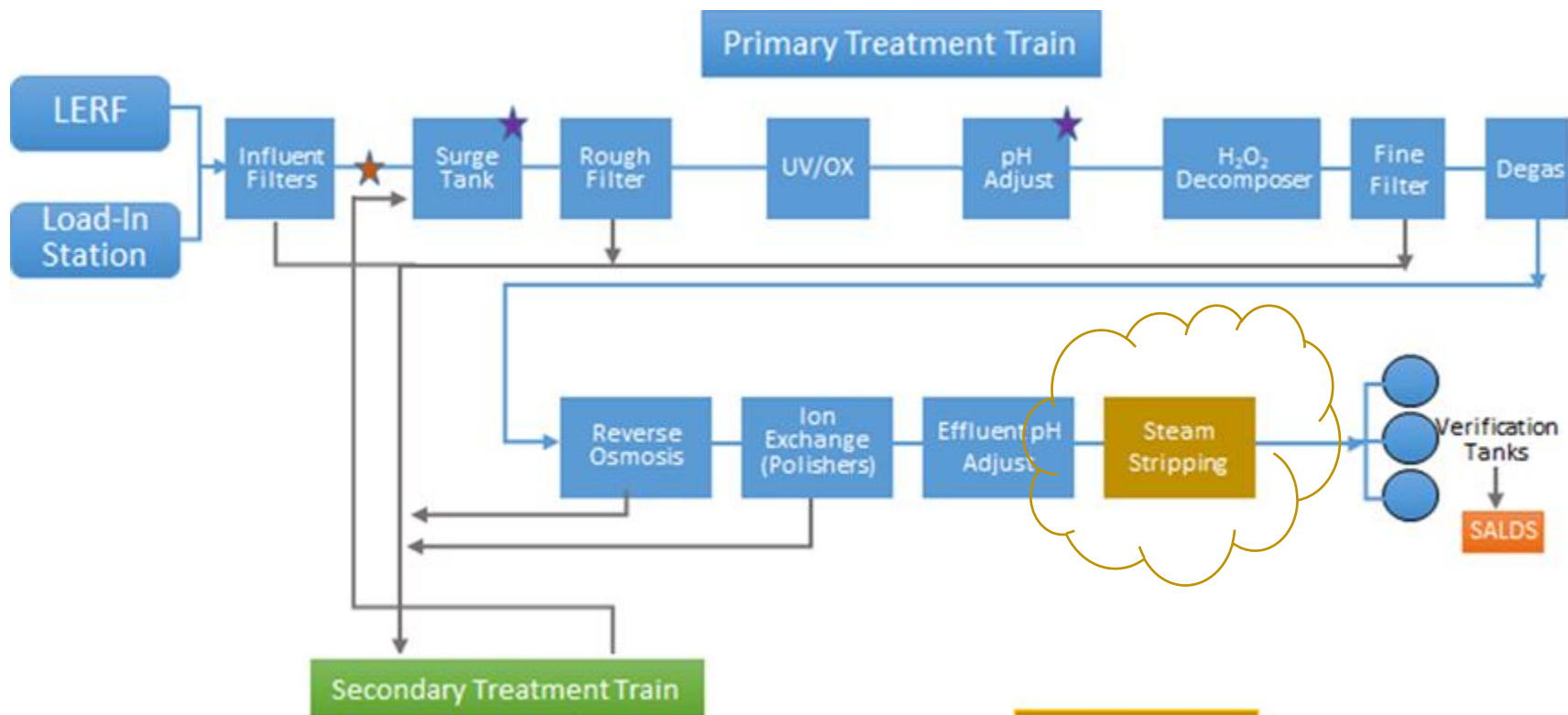


★ Chemical adjustment
With NaOH or H₂SO₄

★ Chemical adjustment
With H₂SO₄

Degas = Degasification Column
LERF = Liquid Effluent Retention Facility
pH Adjust = pH Adjustment Tank
SALDS = State-Approved Land Disposal Site
UV/OX = Ultraviolet/Oxidation

Primary Treatment Train: After Proposed Modification



★ Chemical adjustment
With NaOH or H₂SO₄

★ Chemical adjustment
With H₂SO₄

Optional Operations
for treating WTP
DFLAW Effluent

Degas = Degasification Column
LERF = Liquid Effluent Retention Facility
pH Adjust = pH Adjustment Tank
SALDS = State-Approved Land Disposal Site
UV/OX = Ultraviolet/Oxidation

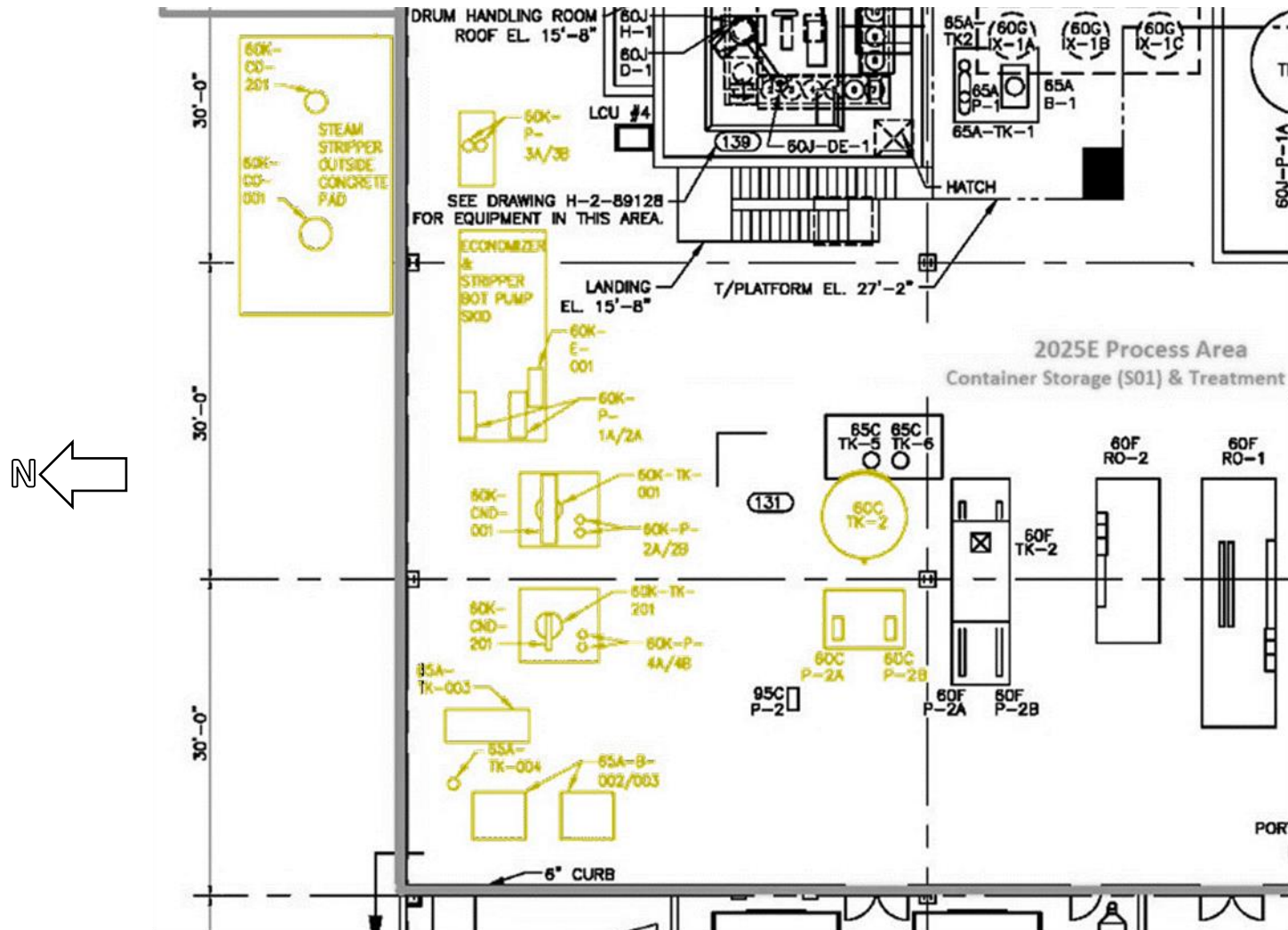
Proposed Permit Modification: Overview

Modifications are proposed that will install a steam stripper system for supplemental organic treatment to provide the 200 Area ETF the capability to treat the WTP DFLAW effluent

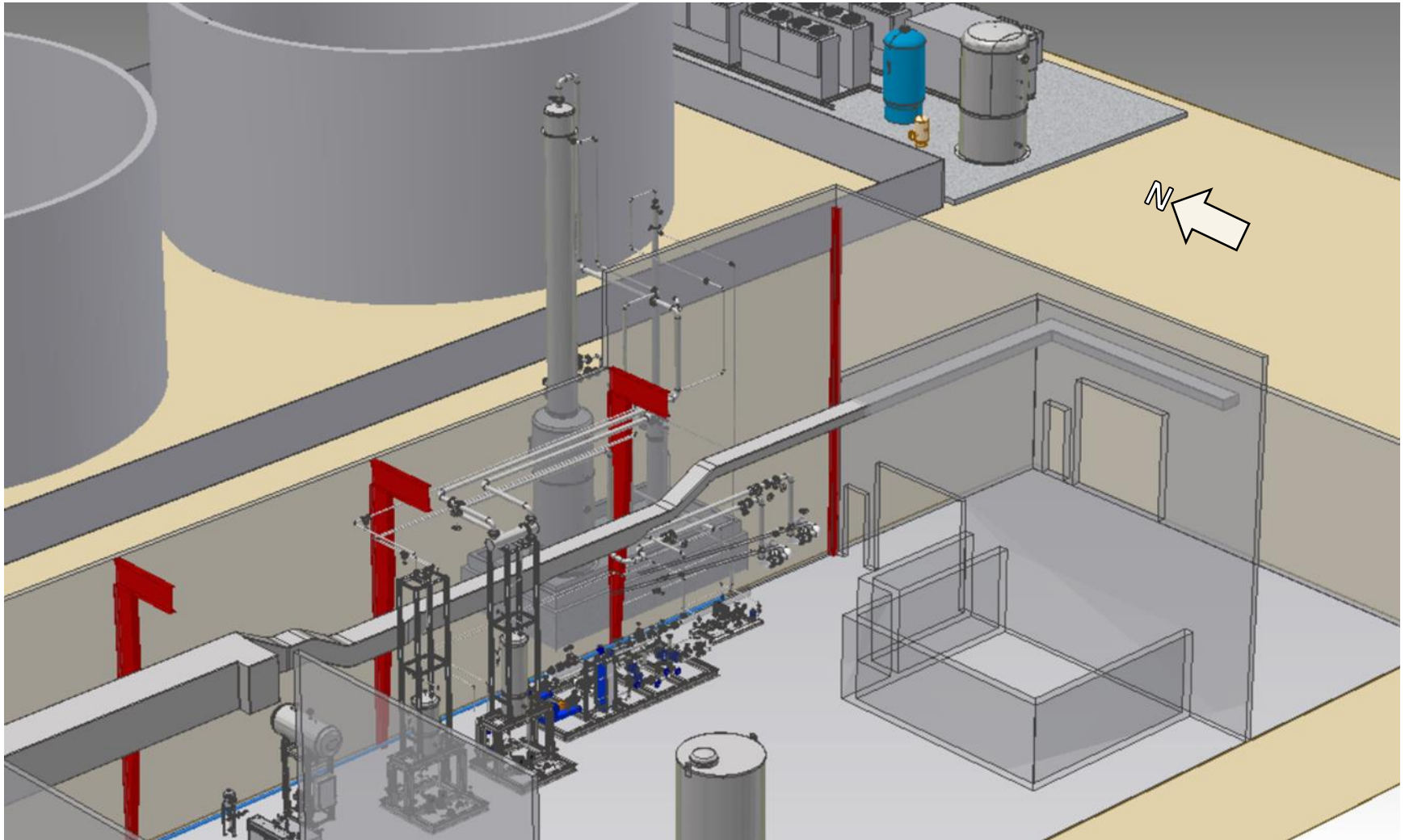
The steam stripper system includes the following:

- Stripper column (60K-CO-001)
- Stripper condensate tank (60K-TK-001)
- Concentrator column (60K-CO-201)
- Concentrator condensate tank (60K-TK-201)
- Distillate tank (60K-TK-202)

Proposed Permit Modification: ETF Ground-Floor Plan (drawing)



Proposed Permit Modification: ETF Ground-Floor Plan (rendering)



Proposed Permit Modification: Overview (cont.)

Modifications are proposed that will install a steam stripper system for supplemental organic treatment to provide the 200 Area ETF the capability to treat the WTP DFLAW effluent

- Support systems include a Process Vent Collection system
- A design assessment for the project was reviewed and certified by an independent, qualified registered professional engineer
(in accordance with WAC 173-303-640)
- The project forecasts beginning installation of the system in late calendar year 2021

Proposed Permit Modification: Modified Addenda

The modified addenda for LERF and 200 Area ETF permit modification include the following:

- Permit conditions
- Addendum B, “Waste Analysis Plan”
- Addendum C, “Process Information”
- Addendum I, “Inspection Requirements”

Refer to the corresponding Hanford Dangerous Waste Permit Change Notice for a full description of the proposed changes

Proposed Permit Modification: Future Related Actions

- The distillate storage tank design and installation will be addressed by a subsequent permit modification
- The distillate will be transferred to an authorized dangerous waste facility for additional treatment
- Permit condition III.3.J.9: Prior to processing waste through the steam stripper system, the permittees must provide the Washington State Department of Ecology with the treatment and disposal pathway for the concentrated acetonitrile distillate secondary waste stream

LERF and 200 Area ETF Class 2 Permit Modification

60-day public comment period is open through Aug. 22, 2021

Submit comments via mail or electronically (preferred) to the Washington State Department of Ecology at the address below:



Daina McFadden
Washington State Department of Ecology
3100 Port of Benton Boulevard
Richland, WA 99354
<http://nw.ecology.commentinput.com/?id=MWf3Y>

Questions?

The Hanford Reach
White Bluffs Overlooking the Columbia River